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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,219	01/21/2004	David A. Cohen	IRO-003	2186

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EXAMINER	
PIGGUSH, AARON C	
ART UNIT	**PAPER NUMBER**
2838	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/762,219	COHEN ET AL.	
	Examiner	Art Unit	
	Aaron Piggush	2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-10,17,19-25 and 31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-10,17,19-25 and 31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/1/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 5, 6, 8-10, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perdue (US 4,679,152) in view of Han (US 5,646,494).

With respect to claim 1, Perdue discloses a method for energy management in a robotic device, the robotic device comprising at least one energy storage unit (no. 207 in Fig. 12) and a signal detector (no. 42 in Fig. 3 and no. 90, 96, and 130 in Fig. 11), the method comprising the steps of:

providing a base station (no. 50 in Fig. 5) for mating with the robotic device, the base station comprising a plurality of signal emitters including a first signal emitter and a second signal emitter (no. 56A/C and B in Fig. 4 and 5 and col 4 ln 65 to col 5 ln 9);

determining a quantity of energy stored in the energy storage unit (no. 209 in Fig. 12 and col 5 ln 34-42) (applicant indicates at the top of page 28 of his specification that energy is monitored by simply measuring voltage or current, which is deemed met by measuring charge state disclosed), the quantity characterized at least by a high energy level and a low energy level (col 10 ln 24-27); and

performing, by the robotic device, a predetermined task based at least in part on the quantity of energy stored (no. 80-140 in Fig. 11 and col 5 ln 34-66); and

returning the robotic device to the base station when the quantity of energy stored is less than the low energy level (no. 80-140 in Fig. 11 and col 5 ln 34-47).

Furthermore, the quantity of energy stored is characterized by a high energy level and a low energy level because if the sensor circuit detects that the battery charge is low (no. 80 in Fig. 11), then the battery is implicitly characterized by a low energy level. Similarly, if the battery charge is not low, then the battery is implicitly characterized by a high energy level.

However, Perdue does not expressly disclose wherein the predetermined task comprises a reduction in energy use by the robotic device. It should be noted that Perdue does disclose stopping the base motors and retracting the extendable arm (col 5 ln 41-45), even though the robotic device will indeed continue movement back to the base station momentarily following the stoppage.

Han discloses a robotic device with a predetermined task based at least in part on the quantity of energy stored wherein that predetermined task comprises a reduction in energy use by the robotic device (col 9 ln 42 to col 11 ln 50 and col 1 ln 53-63), in order to ensure that the robotic device can make it back to the charger under its own power (i.e. avoids interaction by the user) and to prevent discharging the battery while trying to recharge it (avoids unnecessary battery wear).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to reduce the energy used by the robotic device when the energy level is low in the device of Perdue, as did Han, so that the robotic device can make it back to the charger under its own power (avoiding the need for user interaction).

With respect to claim 2, coulometry is deemed met by Perdue by monitoring the charge state (col 5 ln 34-42), since a coulomb is a charge.

With respect to claim 3, Perdue discloses wherein the step of determining a quantity of energy stored comprises setting a time period (col 10 ln 43-56).

With respect to claim 5, Perdue discloses the step of returning the robotic device to the base station in response to reception, by the signal detector, of a base station homing signal (col 6 ln 23-29 and ln 60-68, col 8 ln 25-43, and no. 90-140 in Fig. 11).

With respect to claim 6, Perdue discloses wherein the step of returning the robotic device to the base station occurs when the quantity of the energy stored is less than the high energy level (no. 80-140 in Fig. 11 and col 5 ln 34-47 and ln 25-29).

With respect to claim 8, Perdue discloses wherein a predetermined task further comprises altering a travel characteristic of the robotic device (col 5 ln 41-45 and Fig. 11), however, he does not explicitly state that the travel characteristic results in a reduction in energy use by the robotic device (although this is implied when the base motors are stopped, even if it is momentarily).

Han discloses wherein the predetermined task further comprises altering a travel characteristic of the robotic device (col 9 ln 42 to col 11 ln 50 and col 1 ln 53-63), in order to allow the robotic device to get to the recharging base as soon as possible with a lower amount of energy being expended along the way (helps keep the device from failing before it completely returns to its base).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include altering a travel characteristic of the device (while also reducing the amount of

energy used) when its energy level is low in the device of Perdue, as did Han, so that the robotic device could make it back to the charger before running out of energy (avoids unnecessary user interaction).

With respect to claim 9, Perdue discloses the method further comprising the step of charging the robotic device (col 2 ln 13-16).

With respect to claim 10, Perdue does not expressly disclose the step of resuming the predetermined task.

Han discloses resuming the predetermined task (col 12 ln 29-38), in order to resume cleaning at the point where it had to end before charging (allows complete cleaning with no unnecessary user interaction).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include a step of resuming the predetermined task in the device of Perdue, as did Han, so that the robotic device could completely finish its predetermined task without running out of energy and avoiding user interaction.

With respect to claim 31, Perdue discloses a charge sensor circuit (no. 209 in Fig. 12, which would determine the charge level of the battery), however, does not expressly disclose wherein the quantity is further characterized by a medium energy level. Although, any energy level above the low energy level could be considered a medium energy level before the high energy level is met.

Han also discloses a similar energy level sensor (no. 30 in Fig. 7), which would determine the charge level of the battery (col 6 ln 50-54). This implies that many different

charge levels can exist for the battery, any of which could be considered a medium energy level if they were not at the highest or lowest possible charges of the battery.

It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include a medium energy level (which, as noted above, is implied in both the Perdue and Han references), so that the device could have additional settings/functions associated with another energy level which was above the energy level that required recharging (adds diversity).

3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Perdue (US 4,679,152) and Han (US 5,646,494) as applied to claim 1 above, and further in view of Jones (EP 1 331 537 A1).

With respect to claim 4, Perdue discloses wherein the step of performing the predetermined task occurs when the quantity of energy stored exceeds the high energy level (col 5 ln 34-45 and col 1 ln 15-33, wherein it is implied that the robot was acting in some predetermined manner/task before the low energy level was detected, which in turn caused it to turn off its base motors and retract the arm), the predetermined task comprising movement of the robotic device away from the base station (this is also encompassed in the previous citation wherein it is further implied that the robotic device was moving away from the base station because it needed to return to the base station after the low energy level was detected, also see Fig. 11).

However, he does not expressly disclose wherein the robotic device moves away from the base station in response to reception of a base station avoidance signal.

Jones discloses the movement of the robotic device away from the base station when it is above a predetermined energy level in response to reception, by a signal detector, of a base station avoidance signal (abstract, para 0060, and Fig. 8A-C), in order to keep the robotic device in a specified area without the need of user interaction.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include moving the robotic device away from the base station in response to a base station avoidance signal in the device of Perdue, as did Jones, so that the robotic device can more efficiently carry out its tasks in a predetermined area when the energy level is of a sufficient value (avoids user interaction).

4. Claims 17, 19-21, and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perdue (US 4,679,152) in view of Jones (EP 1 331 537 A1).

With respect to claim 17, Perdue discloses an autonomous system comprising a base station comprising:

charging terminals for contacting an external terminal of a robotic device (no. 51 in Fig. 5 and no. 52 and 54 in Fig. 4); and

a first signal emitter and a second signal emitter (no. 56A/C and B in Fig. 4 and 5 and col 2 ln 38-48).

However, Perdue does not expressly disclose wherein a signal emitter transmits a base station avoidance signal.

Jones discloses a signal emitter for transmitting a base station avoidance signal (abstract and Fig. 8A-C), in order to keep the robotic device in a specified area without the need of user interaction.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include a signal emitter for transmitting a base station avoidance signal in the device of Perdue, as did Jones, so that the robotic device could be contained in a specified area (without user interaction) away from the charging base, until it required recharging.

With respect to claim 19, Perdue discloses wherein the second signal emitter transmits a base station homing signal (col 6 ln 23-29 and ln 60-68, col 8 ln 25-43, and no. 90-140 in Fig. 11).

With respect to claim 20, Perdue discloses wherein the homing signal comprises a pair of signals (no. 56 A and C in Fig. 4 and 5, col 2 ln 38-48, and col 6 ln 23-29).

With respect to claim 21, Perdue discloses wherein the pair of signals comprises a first signal and a second different signal (no. 56 A and C in Fig. 4 and 5, col 2 ln 38-48, and col 6 ln 23-29).

With respect to claim 23, Perdue discloses wherein the first signal emitter and the second signal emitter transmit at least one optical signal (col 6 ln 54-68 and col 2 ln 38-48).

With respect to claim 24, Perdue discloses the autonomous system further comprising a robotic device (no. 20 in Fig. 1 and abstract) for performing a predetermined task, the robotic device comprising:

at least one energy storage unit (no. 207 in Fig. 12) with external terminals for contacting the charging terminals (col 4 ln 56-64); and

at least one signal detector (no. 42 in Fig. 3 and col 2 ln 37-55).

With respect to claim 25, Perdue discloses wherein the at least one signal detector is adapted to detect at least one optical signal (col 2 ln 37-55).

5. Claims 17 and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colens (US 6,389,329) in view of Jones (EP 1 331 537 A1).

With respect to claim 17, Colens discloses an autonomous system comprising a base station comprising:

charging terminals for contacting an external terminal of a robotic device (no. 5 in Fig. 1 and 4); and

a first signal emitter and a second signal emitter (no. 2 and 3b,c in Fig. 3).

However, Colens does not expressly disclose wherein a signal emitter transmits a base station avoidance signal.

Jones discloses a signal emitter for transmitting a base station avoidance signal (abstract and Fig. 8A-C), in order to keep the robotic device in a specified area without the need of user interaction.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include a signal emitter for transmitting a base station avoidance signal in the device of Colens, as did Jones, so that the robotic device could be contained in a specified area (without user interaction) away from the charging base, until it required recharging.

With respect to claim 19, Colens discloses wherein the second signal emitter transmits a base station homing signal (col 12 ln 23-39, col 3 ln 22-40, and col 8 ln 41-44).

With respect to claim 20, Colens discloses wherein the homing signal comprises a pair of signals (col 12 ln 23-39, col 3 ln 22-40, and Fig. 3).

With respect to claim 21, Colens discloses wherein the pair of signals comprises a first signal and a second different signal (col 12 ln 23-39, col 3 ln 22-40, and Fig. 3).

With respect to claim 22, Colens discloses wherein the first signal and the second signal overlap (col 12 ln 23-39 and 3a in Fig. 3).

Response to Arguments

6. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection. Additionally, although the previous office action required a restriction of this application into four groups, the applicant's arguments concerning the validity of the restriction and the newly found prior art concerning the previously allowable subject matter has led the examiner to examine both groups I and III (regarding the previous restriction) in this office action. Therefore, claims 1-6, 8-10, 17, 19-25, and 31 have been treated/examined.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron Piggush whose telephone number is 571-272-5978. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Karl Easthom can be reached on 571-272-1989. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AP

GARY L. LAXTON
PRIMARY EXAMINER

5/8/2007